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NASA-08345 (June 2004)

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA

Superseding NASA-08345 (October 2003)

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NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

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SECTION 08345

SOUND CONTROL DOORS
06/04

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NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers flush steel and wood sound retardant doors with STC ranging from 25 to 45. Doors are limited to standard height and width where noise control is required, relative to speech, music, office equipment, and general sounds.

Sound retardant doors for complex and special applications, where noise control related to machinery, industrial process sounds, automotive, and aircraft sounds are not included. Specification must be revised as required for the specific application. Sound retardant door assemblies include the door, perimeter seals, and metal door frame.

Some companies provide a complete guaranteed package consisting of door, frame, special threshold, and hardware.

Drawings must indicate door locations, sound transmission classification ratings required, UL label requirements, frame construction, details of perimeter seals, and door bottom and vision panel requirements.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: The following references should not be manually edited except to add new references. References not used in the text will automatically be deleted from this section of the project specification.

****

The publications listed below form a part of this section to the extent referenced:

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds	(2003) Architectural Casework - General

ASTM INTERNATIONAL (ASTM)

ASTM A 366/A 366M	(1997e1) Standard Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality
ASTM A 568/A 568M	(2003) Standard Specifications for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
ASTM C 1036	(2001) Standard Specification for Flat Glass
ASTM D 1056	(2000) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D 2092	(1995; R 2001e1) Standard Practice for Preparation of Zinc-Coated Galvanized Steel Surfaces for Paint
ASTM D 4689	(1999) Standard Specification for Adhesive, Casein Type
ASTM E 90	(2002) Standard Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions

1.2 SUBMITTALS

****

NOTE: Review submittal description (SD) definitions in Section 01330 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control. Include a columnar list of appropriate products and tests beneath each submittal description.

****

The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES in sufficient detail to show full compliance with the specification:

SD-03 Product Data

Manufacturer's catalog data shall include STC ratings, and UL fire rating, where applicable, for the following items:

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors
Door Frames

Vision Panels
Seals and Door Bottoms
Thresholds
Astragals

SD-02 Shop Drawings

Fabrication drawings for the following items shall indicate perimeter seals, door-bottom devices and other hardware items to be assembled in the shop.

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors

SD-02 Shop Drawings

Installation drawings for the following items shall include a finish hardware schedule for each door (coordinate with Section 08711 HANGING HARDWARE) and a hollow metal door frame schedule for each door indicating profile, dimensions, hardware reinforcement, and frame anchorage.

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors

SD-06 Test Reports

Test reports for the following shall be in accordance with paragraph entitled, "Guarantee," of this section.

Wind Loading Tests
Water Leakage Tests

SD-07 Certificates

Certificates shall be submitted for the following items and accessories showing conformance with the referenced standards contained in this section.

Hollow Metal Sound Retardant Doors
Wood Sound Retardant Doors
Door Frames
Vision Panels
Seals and Door Bottoms
Thresholds
Astragals

1.3 GUARANTEE

Test reports for Wind Loading Tests and Water Leakage Tests shall be provided by a nationally recognized, independent acoustical laboratory indicating that the sound transmission classification (STC) of the proposed door, based on tests at 16 third-octave band frequencies from 125 to 4,000 hertz, is no less than the specified STC when tested in accordance with ASTM E 90, and that the door tested is hung in substantially the type of wall and frame as indicated and is fully operable with hardware and perimeter seals installed.

Contractor shall guarantee that each door delivered to the project is equal

in construction and sound transmission classification (STC) to that of the sample door tested and that each door assembly, when installed in accordance with the manufacturer's printed instructions, will have an inplace STC within 3 decibels of the specimen tested.

1.4 DELIVERY, HANDLING, AND STORAGE

Doors shall be shipped in the manufacturer's undamaged individual cartons, securely bundled and wrapped with moisture-resistant covers and stored in accordance with the manufacturer's printed instructions in a dry, clean, and ventilated area.

Wood doors shall be delivered and stored in the building following the installation of concrete, terrazzo, plaster, or other wet materials, and only after the building has dried out and has a roof.

Relative humidity in the building shall be between 30 and 65 percent, and the ambient temperature shall be at least 60 degrees F 16 degrees C at the time of installation of wood doors.

Final adjustment of seals shall be made when temperatures and humidity conditions approximate the interior conditions that will exist when the building is occupied.

1.5 FIELD MEASUREMENTS

Measurements shall be taken prior to preparation of drawings and fabrication.

PART 2 PRODUCTS

2.1 GENERAL

Sound retardant door assemblies shall include doors of the thickness, width, and height indicated, complete with perimeter seals, seal housings, automatic door bottoms, thresholds, door frames, and astragals as required to conform to the specified STC.

2.2 STC RATING

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NOTE: Delete inapplicable paragraphs. Drawings must schedule the location and STC rating if more than one STC rating is required.

****

Doors shall have an STC of at least [25] [30] [35] [40] [45].

STC of each door shall be not less than that indicated.

2.3 HOLLOW METAL SOUND RETARDANT DOORS

****

NOTE: Delete the paragraph heading and the following paragraphs if wood sound retardant doors are selected.

****

Door construction shall consist of steel facing sheets conforming to ASTM A

366/A 366M; stretcher level flatness conforming to ASTM A 568/A 568M; not less than 0.0598 inch 1.52 millimeter thick; free from pitting, scale, and surface defects; separated by a core construction designed to meet the required STC; and tested and rated in accordance with ASTM E 90.

Doors shall have flush seamless face sheets and vertical edges. Joints shall be continuous welded and smooth. Edges shall be flush or rabbeted as required for perimeter seals.

Hardware reinforcement shall be steel drilled, tapped to template requirements and welded in place. Minimum thicknesses shall be as follows:

Butts, 0.1494 inch 3.79 millimeter; locksets, 0.1196 inch 3.04 millimeter; surface-applied hardware, 0.0747 inch 1.90 millimeter

Door surfaces shall be visually flat and free from warp, waviness, and other surface irregularities and defects. Maximum allowable warp or twist shall not exceed 1/8 inch 3 millimeter when measured with a 7-foot 2100 millimeter straightedge along the diagonal and shall not exceed 1/16 inch 1.5 millimeter when measured with a 7-foot 2100 millimeter straightedge in the width or in any position along the length of the door.

****

NOTE: Delete the following paragraphs if UL labeled sound retardant doors are not required. Select the UL label rating, if required.

The drawings must indicate sound retardant UL doors.

****

Doors, where indicated, shall bear the UL [3-hour A] [1-1/2-hour B] [3/4-hour C] [1-1/2-hour D] label fire rating and the specified STC.

Sound retardant doors, where indicated, shall bear the UL 3/4-hour E label fire rating and the specified STC.

Exposed surfaces of doors shall be shop painted, including surfaces that are galvanized.

Concealed surfaces of exterior doors, except galvanized surfaces, shall be shop painted.

Surfaces shall be thoroughly cleaned of all mill scale, rust, oil, grease, dirt, and other foreign materials before the application of the shop coat of paint.

****

NOTE: Select the following paragraph if painted galvanized surfaces are required for this project.

****

After cleaning, galvanized surfaces shall be free of paint in accordance with ASTM D 2092, Method A, B, C, or D.

Cleaned prepared surfaces shall be given one shop coat of rust inhibitive metallic oxide or synthetic resin primer applied to dry surfaces by brush, dipping, or other approved method to provide a continuous minimum dry film thickness (dft) of 0.9 mil (0.0009 inch) 0.023 millimeter.

2.4 WOOD SOUND-RETARDANT DOORS

****
NOTE: Delete the paragraph heading and the following paragraphs if metal sound retardant doors are selected.

Drawings must indicate door thickness, width and height, trim, and frame details.
****

Door construction shall consist of wood veneer facings separated by a core construction designed to meet the required STC, and shall be tested and rated in accordance with ASTM E 90.

Doors shall comply with the AWI Qual Stds, "Guide Specifications and Quality Certification Program," for [premium] [custom] [economy] grade constructions and to the requirements specified.

Beveling, prefitting, machining, mortising, and routing for hardware, perimeter seals, and door bottom cutouts shall be performed at the mill.

[Door facings shall be [premium] [custom] [economy] grade with standard thickness face veneers conforming to AWI Qual Stds, Type 1 for stain and transparent job site-applied finish.]

[Door facings shall be a medium density overlay applied over a good grade of hardwood conforming to AWI Qual Stds, Type 3 for job site-applied paint finish.]

[Door facings shall be plastic laminate, 1/16 inch 1.5 millimeter thick, in decorator color and patterns as selected, conforming to AWI Qual Stds, Type 4.]

****
NOTE: Select the face veneer. Delete all selections if medium density overlay facings or plastic laminate facings are required.
****

Face veneers shall be [Natural Birch] [Select Red Birch] [Select White Birch] [Red Oak] [Cherry] [Walnut].

Facing veneer shall match the wall paneling in species, veneer cut, and finish.

****
NOTE: Select the type of veneer cut. Delete all selections if medium density overlay facings or plastic laminate facings are required.
****

Veneer cut shall be [half round] [rotary] [plain sliced] [rift sawn].

****
NOTE: Delete the following paragraph if plastic-laminate doors are selected.
****

Doors to receive a job site-applied finish shall be cleaned and smoothly sanded to remove handling and storage marks, raised grain, and minor surface marks and abrasions.

2.5 DOOR FRAMES

****
NOTE: Drawings must indicate frame profiles and dimensions.
****

Frames shall be fabricated from steel sheets conforming to ASTM A 366/A 366M, not less than 0.0747 inch 1.90 millimeter thick, and free from pitting, scale, stretcher strains, fluting, and surface defects.

Frames shall have 2-inch 50 millimeter faces, profiles and dimensions as indicated, with mitered reinforced corners, welded the full depth of frame and trim, with exposed surfaces ground smooth and flush. Contact edges shall be closed to hairline joints.

Hardware reinforcement shall be steel, drilled and tapped to template requirements, and welded in place. Galvanized dust covers shall be welded over reinforcements. Minimum thicknesses shall be as follows:

Butts, 3/16 inch 4.7 millimeter; lock strike, 0.1196 inch 3.04 millimeter; surface applied hardware, 0.0747 inch 1.90 millimeter

Frame anchors shall be located near the top and bottom of doors and at intermediate points not over 24 inches 600 millimeter on center. Not fewern three anchors shall be provided per jamb.

Floor anchor clips shall be provided at each jamb with 2-inch 50 millimeter vertical adjustments on increments not exceeding 1/16 inch 1.5 millimeter.

A temporary angle spreader shall be welded to the bottom of each jamb and removed at the time of the frame installation.

Surfaces shall be thoroughly cleaned of all mill scale, rust, oil, grease, dirt, and other foreign materials before the application of the shop coat of paint.

Cleaned prepared surfaces shall be given one shop coat of rust inhibitive metallic oxide or synthetic resin primer applied to dry surfaces by brush, dipping, or other approved method to provide a continuous minimum dft of 0.9 mil (0.0009 inch) 0.023 millimeter.

2.6 VISION PANELS

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NOTE: Delete the paragraph heading and the following paragraphs if vision panels are not required. Edit the first paragraph as required for metal or wood doors.
****

Doors with vision panels shall be complete with glazing. Frames, moldings, and stops shall be 0.0747-inch 1.90 millimeter steel or wood to match the door finish, to the profile indicated, assembled with mitered corners and

flush joints, and secured with countersunk phillips-head screws.

Glazing shall be either a single thickness of acoustical plate glass laminated to an inner face of water-clear plastic or multiple thicknesses of 1/4-inch 6 millimeter plate glass, clear or patterned as indicated, and set in glazing gaskets and frames as required to meet the specified STC.

Glass shall conform to ASTM C 1036, Type I, Class 1. Acoustical plate glass shall be a type tested and rated in accordance with ASTM E 90, shall have an STC of not less than 36 and a minimum thickness of 9/32 inch 7.14 millimeter.

2.7 PERIMETER SEALS AND DOOR BOTTOMS

Seal material for heads, jambs, and door bottoms shall be a closed-cell, expanded cellular rubber conforming to ASTM D 1056, Type S, Grade SBE-42 or SCE-42.

Seals shall be installed in formed steel or extruded aluminum shapes designed to receive and hold seals and to provide concealed adjustable attachment to door frames. Concealed adjustment screws not more than 12 inches 300 millimeter on center shall provide at least 3/8-inch 10 millimeter adjustment.

****

NOTE: Include the following paragraph if automatic door bottoms are required.

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Door bottoms shall be assemblies of closed-cell neoprene seals, seal housings, and automatic operating devices, mounted on the doors as indicated. Devices shall be designed to seal the spaces between the doors and the finished floors or thresholds when closed and to retract immediately when doors are opened, with a sill clearance of approximately 1/4 inch 6 millimeter.

2.8 THRESHOLDS

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NOTE: Select the type of threshold. Delete the paragraph heading and both paragraphs if thresholds are not required.

****

Metal thresholds shall be provided where indicated. Thresholds shall be extruded aluminum, 6063-T5 alloy, mill finish, not less than 1/8 inch 3 millimeter thick, with integral seal grooves formed to the indicated section.

Hardwood thresholds shall be provided where indicated and shall be clear, all-heartwood, free of streaks, pin or worm holes, uniform in color, free of defects, finish sanded, and ready for job site transparent or paint finish.

2.9 ASTRAGALS

****

NOTE: Select the type of astragals. Delete the paragraph heading and both paragraphs if astragals

are not required.
****

Steel astragals shall be provided for the inactive leaf of each pair of doors, as indicated, and shall be surface mounted to the door by welded connections or by countersunk, flat-head screws and shall have an integral groove to receive perimeter seal material.

Wood astragals shall be provided for the inactive leaf of each pair of doors. Astragals shall be solid hardwood, shall match the veneer and finish of doors, and shall be surface mounted to doors by screw fasteners or with water- and mold-resistant adhesive conforming to ASTM D 4689, Type II.

PART 3 EXECUTION

3.1 PREPARATION

Door frames shall be inspected and approved before commencing work.

Door frames shall be plumb and true with not more than 1/32-inch 0.8 millimeter deviation in vertical alignment in 8 feet 2440 millimeter and shall be anchored to the wall in accordance with the printed instructions of the manufacturer. Frames shall be grouted solid with mortar in masonry, concrete, and plaster wall construction. Frames in dry wall partitions shall be spot-grouted with mortar at the jamb anchor clips; the space between metal frame and stud partition shall be filled solidly with fiberglass or mineral wool insulation.

3.2 DOOR INSTALLATION

Doors, hardware, and seals shall be installed and adjusted in accordance with the approved drawings, hardware schedules, and the printed instructions of the door manufacturer.

Perimeter seals and automatic door bottom seals shall be installed and adjusted to provide positive compression contact with the entire sealing surface with no gaps, openings, or breaks. Hinges or hardware shall not distort or pinch the perimeter seal during operation of the door.

Door bottom devices shall seal the space between the door bottoms and the finished floor and the space between the seal and seal housing.

Perimeter seal housings shall be field applied with mitered corners and with flush, aligned hairline joints.

-- End of Section --